



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
[www.uspto.gov](http://www.uspto.gov)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/603,608	06/26/2003	Gordon Kenneth Andrew Oswald	1418-37	2888
23117	7590	06/08/2004	EXAMINER	
ALSOMIRI, ISAM A				
ART UNIT		PAPER NUMBER		
		3662		

DATE MAILED: 06/08/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)
	10/603,608	OSWALD ET AL. <i>9</i>
	Examiner Isam A Alsomiri	Art Unit 3662

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 02 April 2004.  
 2a) This action is FINAL.                    2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-31 and 33-56 is/are pending in the application.  
 4a) Of the above claim(s) 32 is/are withdrawn from consideration.  
 5) Claim(s) \_\_\_\_\_ is/are allowed.  
 6) Claim(s) 1-31 and 33-56 is/are rejected.  
 7) Claim(s) \_\_\_\_\_ is/are objected to.  
 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on 26 June 2003 is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- 1) Notice of References Cited (PTO-892)  
 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)  
 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
 Paper No(s)/Mail Date \_\_\_\_\_
- 4) Interview Summary (PTO-413)  
 Paper No(s)/Mail Date \_\_\_\_\_.  
 5) Notice of Informal Patent Application (PTO-152)  
 6) Other: \_\_\_\_\_

**DETAILED ACTION*****Information Disclosure Statement***

The MPEP states the following with respect to large information disclosure statements:

*Although a concise explanation of the relevance of information is not required for English language information, applicants are encouraged to provide a concise explanation of why the English-language information is being submitted. Concise explanations (especially those that point out the relevant pages and lines) are helpful to the Office, particularly where documents are lengthy and complex and applicant is aware of a section that is highly relevant to patentability or where a large number of documents are submitted and applicant is aware that one or more is highly relevant to patentability. -- M.P.E.P. § 609* (emphasis added).

**“Aids to Compliance With Duty of Disclosure,” item 13:**

*It is desirable to avoid the submission of long lists of documents if it can be avoided. Eliminate clearly irrelevant information and marginally pertinent cumulative information. If a long list is submitted, highlight those documents which have been specifically brought to Applicant's attention and/or are known to be of the most significance. -- M.P.E.P. § 2004* (emphasis added).

Therefore, it is recommended that if any information that has been cited by Applicant in the Information Disclosure Statement(s) is known to be material to patentability as defined by 37 C.F.R. § 1.56, Applicant should present a concise statement as to the relevance of that/those particular documents.

***Specification***

The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use.

**Arrangement of the Specification**

As provided in 37 CFR 1.77(b), **the specification of a utility application should include the following sections in order.** Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

- (a) TITLE OF THE INVENTION.
- (b) CROSS-REFERENCE TO RELATED APPLICATIONS.
- (c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
- (d) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC (See 37 CFR 1.52(e)(5) and MPEP 608.05. Computer program listings (37 CFR 1.96(c)), "Sequence Listings" (37 CFR 1.821(c)), and tables having more than 50 pages of text are permitted to be submitted on compact discs.) or REFERENCE TO A "MICROFICHE APPENDIX" (See MPEP § 608.05(a). "Microfiche Appendices" were accepted by the Office until March 1, 2001.)
- (e) BACKGROUND OF THE INVENTION.
  - (1) Field of the Invention.
  - (2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.
- (f) BRIEF SUMMARY OF THE INVENTION.
- (g) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).
- (h) DETAILED DESCRIPTION OF THE INVENTION.
- (i) CLAIM OR CLAIMS (commencing on a separate sheet).
- (j) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).
- (k) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A "Sequence Listing" is required on paper if the application discloses a nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if the required "Sequence Listing" is not submitted as an electronic document on compact disc).

The spacing of the lines of the specification is such as to make reading and entry of amendments difficult. New application papers with lines double spaced on good quality paper are required. Furthermore, examiner suggests submitting replacement specification, which includes larger font size to increase readability and double spacing.

The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

***Claim Objections***

The claims are objected to because the lines are crowded too closely together, making reading and entry of amendments difficult. Substitute claims with lines one and one-half or double spaced on good quality paper are required. See 37 CFR 1.52(b).

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 15 and 22 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The limitation “preferably” is not clear and indefinite.

***Double Patenting***

Claims 1-56 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 20 and 270-323 of copending Application No. 10/203,547. Although the conflicting claims are not identical, they are not patentably distinct from each other because:

Claims 1, 31, 55, and 56 are obvious over copending claim 287.

Claims 3-27 is obvious over copending claims to 288-311.

Claims 28 and 29 are obvious over copending claim 312.

Claim 30 is obvious over copending claim 313.

Claims 47-54 are obvious over copending claims 314-321.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

**Claims 1-6, 8-10, 19-23, 28-31, 33-44, 47-50, 55, and 56 are rejected under 35 U.S.C. 102(b) as being anticipated by Oswald et al. WO 98/00729.**

Referring to claims 1, 28-29, 55, and 56, Oswald discloses in figures 5-7, Apparatus for obtaining positional information relating to an object (see figure 4), comprising: means for transmitting a probe signal towards the object, said transmitting means comprising a transmitting element; means for receiving, at a plurality of spaced apart locations (see figure 7), the probe signal as returned by the object, said receiving means comprising a plurality of receiving element forming an antenna array (102, 104, 106), and detecting means, coupled to the receiving means, for detecting the relative timing of the returned probe signals as received at the plurality of

spaced apart locations (see figures 4-7, Abstract); whereby the positional information for the object can be determined from said relative timing (inherent using at least two receivers, in this case figure 7, three receivers); and wherein the transmitting element and receiving elements are disposed within a single housing or on a common substrate (see figure 7, all antennas on a single substrate).

**Referring to claim 2**, Oswald discloses in figure 7 the device is adapted to be contained within a single housing.

**Referring to claim 3**, Oswald discloses in figure 7 the processing means and the antenna array are constructed as a single assembly (see figure 3).

**Referring to claim 4**, it's inherent that the processing means operates to provide all functional electrical signals to and receive all functional electrical signals from the array (see figure 3).

**Referring to claim 5**, Oswald discloses in figure 7 at least three receiving elements arranged non-collinearly (102, 104, 106).

**Referring to claim 6**, Oswald discloses in figure 7 the at least three receiving elements are arranged such that there is no axis about which the array is symmetrical.

**Referring to claim 8**, Oswald teaches the receiving elements are substantially the same (see figure 3 R x n).

**Referring to claim 9**, it's inherent the transmitting element and receiving element have substantially the same field of view (see figure 7).

**Referring to claim 10**, Oswald discloses the spacing of two pairs of the receiving element in a common direction is unequal (see figure 7).

**Referring to claim 19 and 20**, Oswald teaches a processing stage operable to detect the interval (triangulations) between a signal being received by a first set of any two or more of the receiving elements and to determine a first angular position of an object from which the transmitted signal has been reflected; and to determine the interval between a signal being received by a second set of any two or more of the receiving elements and to determine a second angular position of an object from which the transmitted signal has been reflected (using the three receivers; see pages 20 – 21, figure 7).

**Referring to claim 21**, Oswald teaches the detecting means comprises switched sampling stages triggered from a common signal distributed via delay lines (see Abstract).

**Referring to claim 22**, Oswald teaches the frequency of the transmitted signal is between 0.5 and 77 GHz (see page 9 lines 1-4).

**Referring to claim 23**, Oswald teaches the frequency of the transmitted signal is one of approximately 6 GHz (see page 9 lines 1-4).

**Referring to claim 30**, Oswald teaches the positional information includes at least one of the range, azimuth and elevation of the object (see figure 7).

**Referring to claim 31**, Oswald discloses in figure 4 a warning zone definition stage for defining a warning zone (entering regions of interest 34 and 36) within a detection field of the apparatus; and a discrimination stage for determining whether a detected object is within the warning zone; in which the warning zone is defined as a three-dimensional region within the detection field (inherent, using three or more receivers), wherein the warning zone is contained within and is smaller than the detection field of the apparatus 33 (see figure 4).

**Referring to claim 33,** it's inherent that the shape of the warning zone is dissimilar from the shape of the detection field of the apparatus because the detection field at the maximum range, the warning zones are specific range areas of interest.

**Referring to claim 34,** it's inherent that the warning zone definition stage is adapted to define a warning zone as a function of coordinate (position 42) within the detection field (up to 33) (see figure 4).

**Referring to claim 35,** Oswald teaches an object (target) location stage 42 for determining the position of a detected object within the detection field of the apparatus.

**Referring to claim 36,** it's inherent that the discrimination stage is adapted to determine the coordinates of the detected object and to compare the determined coordinates with the coordinates of the warning zone to determine whether the object is within the warning zone.

**Referring to claim 37,** Oswald teaches the warning zone definition stage is adapted to define a plurality of non-coextensive warning zones (34 and 36), and preferably wherein the discrimination stage is adapted to generate an output signal indicative of which of the plurality of warning zones contains the object.

**Referring to claim 38,** it's inherent that the discrimination stage is adapted to apply different logic to at least two of the zones (to be able to distinguish between the different zones).

**Referring to claim 39,** it's inherent the warning zone is approximately cuboid.

**Referring to claim 40,** it's inherent wherein the discrimination stage is adapted to analyze a characteristic of an object outside of the warning zone (see figure 4; detecting "objects entering region of interest from sides").

**Referring to claim 41**, Oswald teaches the discrimination stage is operable to track an object outside the warning zone and to predict its entry into the warning zone (see page 14 lines 6-17).

**Referring to claim 42**, Oswald teaches the warning zone definition stage is adapted to determine the shape and a relevant dimension of the warning zone at least in part by a corresponding shape and dimension of a vehicle associated with the apparatus (see figure 6).

**Referring to claims 43 and 44**, Oswald teaches the warning zone definition stage is adapted to determine the shape and a relevant dimension of the warning zone in dependence on operating conditions of a vehicle associated with the apparatus (see pages 4-7).

**Referring to claim 47**, Oswald teaches the radar system used in a vehicle (see figure 7).

**Referring to claim 48**, Oswald discloses in figure 7 the antenna array is adapted to be located on a fixed location on the vehicle.

**Referring to claim 49**, Oswald discloses in figure 7 the antenna array is adapted to be located within a component of the vehicle.

**Referring to claim 50**, Oswald discloses in figure 7 the antenna array is adapted to be located within a bumper of the vehicle.

*Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claims 17, 18, 24, and 51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oswald et al. WO 98/00729.**

**Referring to claims 17 and 18,** Oswald is silent about teaches the receiving elements are spaced apart by distance that is the same order of magnitude as the wavelength  $\lambda$  of the radiation that it is intended to transmit and receive, which depend on the area. However, the distance or spacing between the receiving elements depends on the range or sweep desired by the system, Oswald teaches the spacing depends on the range gates and the sweep of the system (see pages 16 and 17). Therefore, it would have been obvious to modify Oswald's system to have the spacing equal to the wavelength of the transmit/receive radiation depending the range and sweep of the system. Furthermore, having the spacing between the elements of the receiving array equals to the radiation is well known and is obvious to include in Oswald system.

**Referring to claim 24,** Oswald is silent about the frequency of the transmitted signal is 2.45 GHz. However, using such frequency is well known and a wide range of frequency is used in many similar systems that include 2.45 GHz. Therefore, it would have been obvious to modify Oswald to include the 2.45 GHz transmit/frequency depending on the range and noises in the system and clutter from other system and other similar factors for choosing a transmit frequency.

**Referring to claim 51,** it's inherent that Oswald's system is capable of for obtaining information about object within or behind a wall (since the signals are radar signals which are able to penetrate different objects such as walls); furthermore, since the system can detect

multiple objects which might be locating one behind the other, it is inherent the radiation used can penetrate a wall and detect what's behind it.

**Claims 7, 11, 13-14, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oswald et al. WO 98/00729 in view of Hane et al. WO 86/00716.**

**Referring to claim 7,** Oswald as mentioned above teaches three sensing elements. . . .  
Oswald is silent about teaching four receiving elements arranged non-collinearly. However, having more than three receivers is just a obvious to include to have more measurement and to obtain better measurements. Hane teaches the four receiving elements arranged non-collinearly (see figure 3). It would have been obvious to modify Oswald to include a fourth receiver to obtain even more measurements and to increase the accuracy.

**Referring to claim 11,** Oswald does not teach the receiving elements are arranged substantially at the vertices of a trapezial locus. Hane teaches the elements are arranged at the vertices of a trapezial locus (see figure 3). It would have been obvious to modify Oswald to include a fourth receiver to arrange the receiving elements at the vertices of a trapezial locus to obtain even more measurements and to increase the accuracy.

**Referring to claims 13 and 16,** Hane teaches the especial locus is rectangular (see figure 3). Hane teaches the four receiving elements arranged non-collinearly (see figure 3). It would have been obvious to modify Oswald to include a fourth receiver to obtain even more measurements and to increase the accuracy

**Referring to claim 14,** Hanes does not teach the trapezial locus is non-rectangular. However, arranging the four receivers so they are non-rectangular is well known and obvious

and is a design chose. It would have been obvious to arrange the four receivers non-rectangular for design reasons or surface area reasons.

**Claims 25-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oswald et al. WO 98/00729 in view of Kerry et al. WO 97/14058.**

**Referring to claim 25,** Oswald does not teach means for applying a cross-correlation process to the returned probe signals. Kerry teaches cross-correlating the returned probe signals (see claim 7). It would have been obvious to modify Oswald's system to include cross-correlation of the returned signals for more accurate measurements and position determination.

**Referring to claim 26,** it's inherent that the cross-correlation process is a truncated cross-correlation process. Even if it is not inherent, truncated cross-correlation is well known and it would be obvious to include for fasted and more efficient processing.

**Referring to claim 27** it's is inherent that the cross-correlation process is applied after a sampling Process.

**Claims 45 is rejected under 35 U.S.C. 103(a) as being unpatentable over Oswald et al. WO 98/00729 in view of Breed et al. US 5,829,782.**

**Referring to claim 45,** Oswald is silent about the warning zone definition stage is adapted to define a detection field within a passenger compartment of a vehicle associateable with the apparatus. Breed teaches a radar system for monitoring the interior of a vehicle and position

of the driver and contents and/or parts of the passenger compartment; which reads on the claimed “detection field within a passenger compartment of a vehicle”. It would have been obvious to modify Oswald’s system to be used for detection and monitoring of the passenger compartment to detect the vehicle occupants to provide safety operation such as airbags.

**Claims 46 and 52-54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oswald et al. WO 98/00729 in view of Chen et al. US. 6,326,915.**

**Referring to claim 46,** Oswald does not teach a display adapted to present a visual representation of a detection field of the apparatus and an object within the detection field. However, display systems are well known. Chen teaches a similar system for detecting location of obstacle and a display 12 adapted to present a visual representation of a detection field of the apparatus and an object within the detection field (see figure 3). It would have been obvious to modify Oswald’s system to include the display system to provide the driver with a visual picture of the objects to avoid accidents.

**Referring to claim 52,** Oswald does not teach means for providing an image of an environment in conditions that human vision is compromised. Chen teaches for providing an image of an environment in conditions that human vision is compromised (to view objects from located behind the car). It would have been obvious to modify Oswald’s system to include the display system to provide the driver with a visual picture of the objects to avoid accidents.

**Referring to claim 53,** it’s inherent that the display in Chen’s system is operable when vision is compromised by the physiological condition of a user (not being able to look at the rear).

**Referring to claim 54,** it's inherent that Chen's system is operable when vision is compromised by environmental conditions. Even if it is not inherent that the display is operable when vision is compromised by environmental conditions such as rain or darkness. Display systems that are designs for darkness or other environmental conditions are well known; and it would be obvious to modify Oswald and Chen's system to include such display devices.

*Conclusion*

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The prior art cited to (Fleischhauer et al.; Shaw et al.; Herman) show various radar systems using multiple sensors to determine location of objects.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Isam A Alsomiri whose telephone number is 703-305-5702. The examiner can normally be reached on Monday-Thursday and every other Friday (8:30-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas H Tarcza can be reached on 703-306-4171. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Isam Alsomiri

  
JOHN B. SOTOMAYOR  
PRIMARY EXAMINER



May 23, 2004